

REMARKS

The Office Action dated October 1, 2007, has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

By this response, claims 1-2 and 6-8 have been amended to more particularly point out and distinctly claim the subject matter of the invention. No new matter has been added. Accordingly, claims 1-8 are currently pending in the application, of which claims 1 and 6 are independent claims.

In view of the above amendments and the following remarks, Applicants respectfully request reconsideration and timely withdrawal of the pending claim rejections for the reasons discussed below.

Claim Rejections under 35 U.S.C. §102(b)

The Office Action rejected claims 1 and 3-8 under 35 U.S.C. §102(b) as allegedly being anticipated by Bulgrin (U.S. Patent No. 5,456,870) ("Bulgrin"). The Office Action alleged that Bulgrin discloses every feature recited in claims 1 and 3-8. Applicants respectfully submit that the claims recite subject matter that is neither disclosed nor suggested in Bulgrin.

Claim 1, upon which claims 2-5 are dependent, recites an injection molding machine. The injection molding machine includes a cylinder member, an injection member disposed in the cylinder member such that the injection member can advance

and retreat, and a plurality of heaters disposed on the outer circumference of the cylinder member. The injection molding machine also includes temperature detection sections disposed on the cylinder member at a plurality of positions along an axial direction thereof so as to detect temperature, a recording device which stores a recorded target temperature distribution range indicating an optimal temperature range at each position of the cylinder member, and a control section for adjusting set temperatures of the heaters such that each of the temperatures detected by the temperature detection sections falls within the target temperature distribution range.

Claim 6, upon which claims 7-8 are dependent, recites an injection molding method. The method includes detecting a plurality of temperatures of a cylinder member by use of temperature detection sections disposed on the cylinder member at a plurality of positions along an axial direction thereof, and reading from a recording device a target temperature distribution range indicating an optimal temperature range at each position of the cylinder member. The method also includes adjusting set temperatures of a plurality of heaters disposed on the outer circumference of the cylinder member such that each of the temperatures detected by the temperature detection sections falls within the target temperature distribution range.

As will be discussed below, Bulgrin fails to disclose or suggest every feature recited in claims 1 and 3-8, and therefore fails to provide the features of the claims discussed above.

Bulgrin is directed to an improved temperature control system using a state controller with two degrees of freedom to regulate the temperature of the barrel of an injection molding machine (Bulgrin, Abstract; col. 3, line 59, to col. 7, line 6).

Applicants respectfully submit that Bulgrin fails to disclose or suggest every feature recited in claims 1 and 6. Specifically, Bulgrin fails to disclose or suggest, at least, “a recording device which stores a recorded target temperature distribution range indicating an optimal temperature range at each position of the cylinder member; and a control section for adjusting set temperatures of the heaters such that each of the temperatures detected by the temperature detection sections falls within the target temperature distribution range” as recited in claim 1, and similarly recited in claim 6.

The Office Action cited column 8, line 59, to column 9, line 12, and column 20, lines 18-54, to allege that Bulgrin clearly discloses the features recited in claims 1 and 3-8 (See Office Action on page 2). Rather, Bulgrin discloses cylindrical barrel 12 including four heater bands 20a-d and four thermocouples 26a, 26b, 26c and 26d. The four heater bands 20a-d and four thermocouples 26a, 26b, 26c and 26 are positioned at the rear, center, front, and nozzle areas of cylindrical barrel 12. Bulgrin further discloses operator console screen 28 for displaying a variety of machine-operated pictures or views, one of which, controls heater bands 20a-d and visually shows the present temperature sensed by thermocouples 26a, 26b, 26c and 26d. The operator dials in a desired temperature and a set point signal temperature for each heat band 20a-d. Because operator console screen 28 typically shows the present temperature of thermocouples 26a, 26b, 26c and 26d, the

operator has a visual check of the barrel temperature where he can see a thermal run away, breakdown, etc (Bulgrin, col. 8, line 59, to col. 9, line 12).

Hence, Bulgrin discloses that the operator monitors four locations along cylindrical barrel 12, visually alerting the operator of changed conditions within cylindrical barrel 12. The operator manually adjusts the four heater bands 20a-d based upon these alerts.

Bulgrin further discloses thermocouple 120 used to sense the temperature of plastic melt 13. The readings are sent to feed forward state controller 122 which uses linear predictive coefficients or coding to develop a predictive temperature signal schematically, which is shown schematically inputted on line 123 as heat inputted to inner layer 4, and which constitutes a disturbance factor $F(t)$. Bulgrin further discloses use of shear heat results from the rotational speed of ram screw 17 (See Figure 11, col. 20, lines 37-58).

Hence, temperature readings of plastic melt 13 are used to develop a predictive temperature signal which is inputted as heat into cylindrical barrel 12.

Thus, Bulgrin fails to disclose or suggest, at least, “a recording device which stores a recorded target temperature distribution range indicating an optimal temperature range at each position of the cylinder member; and a control section for adjusting set temperatures of the heaters such that each of the temperatures detected by the temperature detection sections falls within the target temperature distribution range” as recited in claim 1, and similarly recited in claim 6 (emphasis added).

Claim 3-5 depend from claim 1. Claims 7-8 depend from claim 6. Accordingly, claims 3-5 and 7-8 should be allowable for at least their dependency upon an allowable base claim, and for the specific limitations recited therein.

Therefore, Applicants respectfully request withdrawal of the rejections of claims 1 and 3-8 under 35 U.S.C. §102(b), and respectfully submit that claims 1 and 6, and the claims that depend therefrom, are in condition for allowance.

Claim Rejections under 35 U.S.C. §103(a)

The Office Action rejected claim 2 under 35 U.S.C. §103(a) as being allegedly unpatentable as obvious over Bulgrin, as applied to claim 1, and further in view of either Hehl (U.S. Patent No. 5,159,957) (“Hehl”) or JP 61-235120 (“JP ‘120”). Applicants respectfully submit that the claims recite subject matter that is neither disclosed nor suggested in the combination of Bulgrin and either Hehl or JP ‘120.

As will be discussed below, Bulgrin in view of Hehl or JP ‘120 fails to disclose or suggest every feature recited in claim 2, and therefore fails to provide the features of the claims discussed above.

Bulgrin was discussed above. Hehl is directed to supply and return passages of an apparatus, each of which also defines a valve passage, which contains a rotary valve for controlling the flow rate in a cooling circuit of an injection molding machine (Hehl, Abstract; col. 1, line 45, to col. 3, line 2).

JP '120 is directed to a temperature control device comprising a first thermocouple provided at a base of a cylinder below a retainer ring to detect a temperature, a temperature control device having the thermocouple as the temperature sensor, a heater controlled by the control device, a second thermocouple inserted into the cylinder below a hopper hole to detect the temperature in the hopper jacket, and a solenoid valve to control the flow rate of cooling water passing through the hopper jacket, whereby the solenoid valve is controlled by the signals from the second thermocouple to control a resin temperature (JP 120, Abstract).

As previously noted, Applicants respectfully submit that Bulgrin fails to disclose or suggest every feature recited in claim 1. Specifically, Applicants respectfully submit that Bulgrin fails to disclose or suggest, at least, “a recording device which stores a recorded target temperature distribution range indicating an optimal temperature range at each position of the cylinder member; and a control section for adjusting set temperatures of the heaters such that each of the temperatures detected by the temperature detection sections falls within the target temperature distribution range” as recited in claim 1. Applicants respectfully submit that both Hehl and JP '120 fail to cure the deficiencies of Bulgrin with respect to the aforementioned claim features.

Accordingly, Bulgrin in view of either Hehl or JP '120 fails to disclose or suggest every feature recited in claim 1.

Claim 2 depends from claim 1. Accordingly, claim 2 should be allowable for at least its dependency upon an allowable base claim, and for the specific limitations recited therein.

Therefore, Applicants respectfully request withdrawal of the rejections of claim 2 under 35 U.S.C. §103(a), and respectfully submit that claim 1, and the claims that depend therefrom, are in condition for allowance.

CONCLUSION

In conclusion, Applicants respectfully submit that Bulgrin, Hehl, and JP '120, alone or in combination, fail to disclose or suggest every feature recited in claims 1-8. The distinctions previously noted are more than sufficient to render the claimed invention unanticipated and unobvious. It is therefore respectfully requested that all of claims 1-8 be allowed, and this present application be passed to issuance.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, Applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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Enclosures: Information Disclosure Statement
PTO-1449 Form
4 References